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Improvised Explosive Devices (IED's) continue to be the number one casualty producing weapon against U.S. and coalition forces throughout Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Although not a new weapon, IED's have recently gained tremendous publicity as an effective and inexpensive means to target and engage a technologically superior adversary. In 2010 when RCT-1 deployed to Helmand Province, Afghanistan, they encountered a high IED threat environment. In response, RCT-1 developed a robust Counter-IED (C-IED) cell designed to combat the threat through a combined arms approach. The RCT-1 model represents a unique case study in how future units can organize and operate a tactical level C-IED cell. As IED's are expected to remain a common method to disrupt U.S. mobility in future conflicts, the paper advocates increased training and further institutionalization of the threat into overall operational planning and execution.

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Executive Summary

Title: Regimental Combat Team One in Afghanistan: A Case Study into the Organization and Operation of a Tactical Level C-IED Cell.

Author: Major Michael G. Hays, United States Marine Corps

Thesis: In its recent deployment to Afghanistan in support of Operation Enduring Freedom (OEF) 10.2, Regimental Combat Team One (RCT-1), waged a true combined arms campaign against IED's through the effective formation of a robust and integrated tactical level C-IED cell.

Discussion: Improvised Explosive Devices (IED's) continue to be the number one casualty producing weapon against U.S. and coalition forces throughout Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Although not a new weapon, IED's have recently gained tremendous publicity as an effective and inexpensive means to target and engage a technologically superior adversary. In 2010 when RCT-1 deployed to Helmand Province, Afghanistan, they encountered a high IED threat environment. In response, RCT-1 developed a robust Counter-IED (C-IED) cell designed to combat the threat through a combined arms approach. This was accomplished through effective staff organization, development of a reoccurring C-IED battle rhythm, and by effectively integrating all warfighting functions and enablers. The difficulty RCT-1 encountered in developing of a C-IED cell, was the lack of a doctrinal framework to work from. Halfway through the RCT's deployment, the Marine Corps published *MAGTF C-IED Operations*, which bridged the gap in knowledge, and laid the foundation for future units to organize.

Conclusion: The RCT-1 model represents a unique case study in how future units can organize and operate a tactical level C-IED cell. Analyzing the RCT-1 example, highlights some of the challenges associated with a robust cell, but also to a large degree validates the current USMC C-IED doctrine. As IED's are expected to remain a common method to disrupt U.S. mobility in future conflicts, the paper advocates increased training and further institutionalization of the threat into overall operational planning and execution.

DISCLAIMER

THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

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Preface

The genesis of this topic first developed in Afghanistan, but was originally shelved for a different subject. Only after increased interest on how RCT-1 conducted C-IED operations from individuals and units preparing for deployment, did the topic come back to the forefront. Changing topics halfway through the school year provided unique challenges, but was rewarding to revisit a subject that will continue to be relevant in future conflicts. My goal in writing about RCT-1's Combined Arms C-IED approach, was to provide an effective model for how units can organize and structure a tactical level C-IED cell for a high threat environment. For RCT-1 who started the deployment lacking an overall C-IED framework, the end result was an evolutionary process to integrate all available tools in order to combat the threat.

This paper would not have been possible had it not been for the support of multiple individuals. I would like to thank Dr. Wineman for his mentorship and guidance throughout the process. Dr. Wineman provided me the much needed flexibility to complete the project while challenging me to produce a product that would elevate the topic, and be of value to the Marine Corps. I would like to thank my wife for the constant support and time she provided me to conduct research and write the paper. Lastly, I would like to thank the members of the RCT-1 C-IED cell who dedicated their time, talent, and energy throughout the deployment. Their efforts undoubtedly saved numerous lives and facilitated mission accomplishment through the creative application and employment of all resources to counter the threat posed by this deadly weapon.

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"RCT-1 had the most comprehensive understanding of the IED threat of other units I have seen. Other units looked at the IED problem as a separate entity from their lines of operations. It was a stove piped approach. RCT-1 tracked IEDs, but their goal was not how many they could find per month, their goal was the completion of the mission, with IED's being found along the way."[1]

Major Eelman, MCWL C-IED Division

Introduction

Improvised Explosive Devices (IED's) are a persistent and deadly threat facing United States and coalition forces in the Global War on Terror (GWOT). From 7 October 2001 to 21 December 2011, IED's were responsible for 34,114 or 64% of the total U.S. military casualties during Operations Enduring Freedom, Iraqi Freedom, and New Dawn.[2] Although not a new weapon, IED's have recently gained tremendous publicity as an effective and inexpensive means to target and engage a technologically superior adversary. IED's have become a tactical weapon that when used effectively, have potentially strategic effects.[3] In 2006, the U.S. established the Joint IED Defeat Organization (JIEDDO) to counter the effectiveness of IED's.[4] Since its formation, a tremendous amount of money has been invested into increased Counter IED (C-IED) training and development of technological means to detect or defeat IED effectiveness. From 2006 to October of 2011 JIEDDO spent 16.6 billion dollars on their three Lines of Operations (LOO's): Attack the Network (AtN), Defeat the Device (DtD), and Train the Force (TtF).[5]

Like all services, the Marine Corps has benefited from the advances made from the Joint endeavor, but until recently the primary focus has been on providing technological means to counter the threat of IED's. As a result the Marine Corps did not have an effective doctrinal foundation to adequately prepare unit staffs to wage a combined arms approach against IED's

through the formation, training, and organization of a tactical level C-IED Cell**.** With the release of Marine Corps Interim Publication (MCIP) 3-17.02, *Marine Air Ground Task Force (MAGTF) C-IED Operations*, in January 2011, the template for Marine Corps C-IED cells was made available. Unfortunately, this did not benefit Regimental Combat Team-1 (RCT-1), who deployed in 2010 to Afghanistan in support of Operation Enduring Freedom (OEF) 10.2 prior to its publication. Despite not having comprehensive training or doctrinal framework, RCT-1 waged a true combined arms campaign against IED's through the effective formation of a robust and integrated tactical level C-IED cell.

The intent of this paper is to utilize RCT-1's recent experience to demonstrate the organization and operation of a C-IED cell in comparison to current USMC doctrine. Because RCT-1 created their C-IED Cell prior to the release of *MAGTF C-IED Operations*, the case study provides an alternate perspective to confirm the effectiveness of the newly recommended model. To augment the research, the paper will also look at the current training units receive in the formation and organization of C-IED cells and the integration of training standards across the Marine Corps. Finally, the paper will analyze the adaptability and future employment of C-IED cells as the threat environment changes, and offer four recommendations for refining how the Marine Corps prepares future units for an IED threat. Due to the sensitive nature and classification of some C-IED topics, certain details are either omitted or described in general terms for the purpose of the paper.

Historical Perspective

The use of IED's within warfare is not a new trend**.** As alluded to in the introduction, the first U.S. encounter with IED's did not start with either Taliban or al-Qaeda forces in OEF or OIF, but instead was first observed as a Confederate tactic during the Civil War.[6] Whether previously being called an infernal machine, booby trap, torpedo, or land mine, the employment

as a weapon remains largely the same. During the Civil War, the main charge of one particular type of IED found at Fort Columbus, Kentucky in 1862, bears a striking resemblance to the pressure cooker's now found on the battlefields of Afghanistan.[7] IED employment continued through both WWI and WWII, but gained more widespread use in Vietnam. An examination of current low metallic pressure switches found on victim operated IED's (VOIED) in Afghanistan are nearly identical to VC or NVA booby trap examples published by Military Assistance Command Vietnam (MACV) 45 years ago.[8] While many of the employment techniques remain the same, the impact of IED's have dramatically increased as a result of globalization and advanced communications. It is now possible to post videos of IED attacks within hours of the event, in an attempt "maximize the psychological (and perhaps political) effectiveness of the IED and distract U.S. efforts at the strategic level."[9] Figure 1, demonstrates the lethality and prevalence of IED's attacks within the current conflict.

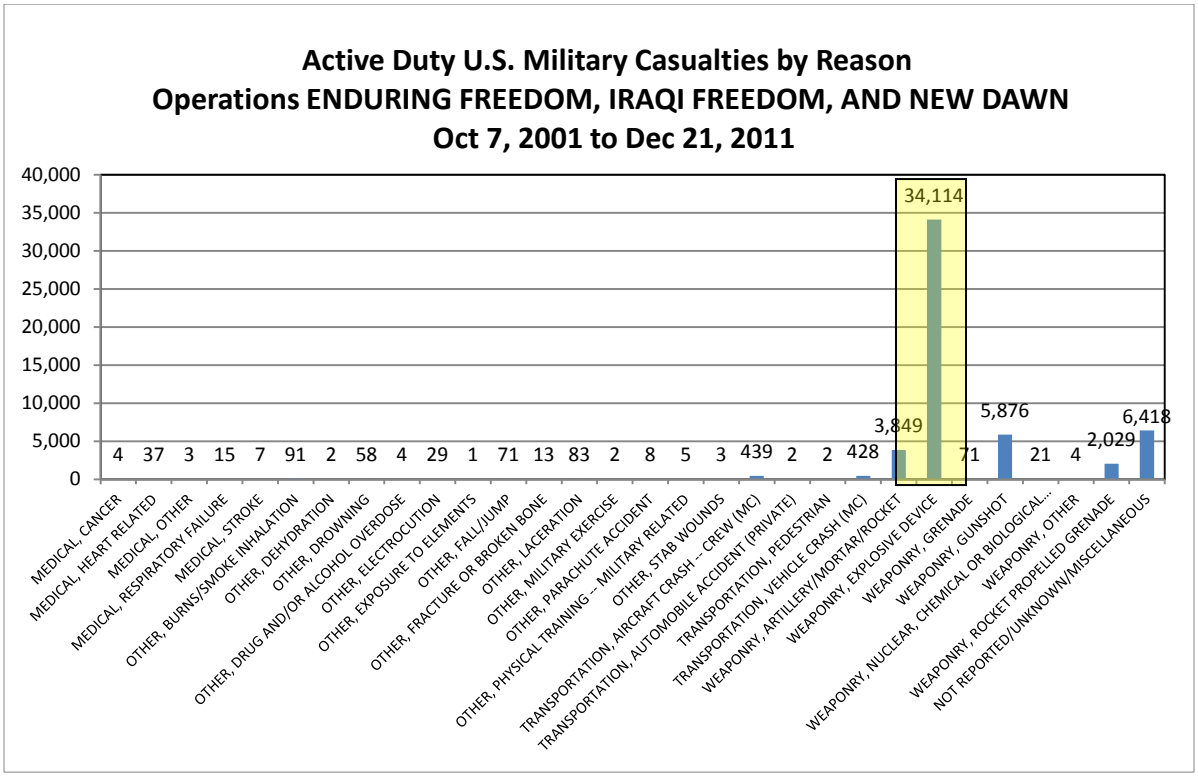

Figure 1. Active Duty U.S. Military Casualties by Cause (Graph created by author) [10]

Defining Combined Arms C-IED

Before proceeding into the discussion on C-IED, it is necessary to accurately understand the concepts that make up the focus of this paper. Joint Publication 1-02, *DoD Dictionary of Military and Associated Term,* defines an IED as "A device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military stores, but is normally devised from nonmilitary components."[11] Although entitled *Combined Arms C-IED Defeat Operations,* Marine Corps Interim Publication 3-17.01 (Army Publication FM 3-90.119), does not offer a distinct definition of what exactly it means by combined arms C-IED. The Marine Corps defines combined arms as: "1. The full integration of combat arms in such a way that to counteract one, the enemy must become more vulnerable to another. 2. The tactics, techniques, and procedures employed by a force to integrate firepower and mobility to produce a desired effect upon the enemy."[12] Without an available definition, this paper offers the following: Combined Arms C-IED Operations: The coordination, integration, and synchronization of all warfighting functions to reduce the threat and effectiveness of IED's, in order to provide the necessary mobility to maneuver in the accomplishment of the assigned mission.

With that interim definition in place, it is important to remember the primary purpose of C-IED operations. C-IED operations are not merely the eradication of the devices, and the individuals who manufacture them. Instead, it is the threat that IED's pose to the overall mission. IED's act primarily as an obstacle that inhibits mobility, reduces operational tempo, drains combat power, and introduces increased fear and friction. These negative effects pose a direct threat to the successful accomplishment of the mission, and for that reason IED's should receive dedicated attention when operating in a high threat environment.

RCT-1 C-IED Cell Organization

Combined Arms C-IED Defeat Operations published in 2007 provided the first holistic approach to integrating multiple disciplines in order to countering the threat. Although alluding to C-IED cells, its primary focus was "to develop a doctrinal approach that facilitates the coordination and synchronization of those tasks most critical to successful IED defeat operations."[13] It attempted to accomplish this through an understanding of the IED operational environment, providing planning considerations and tactical TTP's, and focusing on staff integration through the Military Decision Making Process (MDMP) or Marine Corps Planning Process (MCPP). The publication's mention of C-IED cells is limited to the introduction, stating that "at the BCT and RCT echelon and the tactical level, a single integrated IED defeat cell is typically created to optimize the available assets and respond to the requirement for very rapid synchronization of staff interaction."[14] The publication, however, failed to provide any foundation or template for the organization and operation of the C-IED cell it recommended.

Shortly after arriving in Helmand Province, Afghanistan and fully realizing the extent of the IED threat, the RCT-1 Headquarters established a C-IED cell and created a weekly working group (WG) to focus on the threat. In contrast to the previous RCT Headquarters which had neither a cell nor a C-IED working group, and in light of the *MAGTF C-IED Operations* not being released, the model upon which to base the structure was their own. RCT-1 realized early on that there was no one solution or "silver bullet" to the threat. It would require a multi-disciplined and holistic combined arms approach. From the point of view of the 1st Marine Division C-IED officer in Afghanistan, RCT-1 initially lacked the understanding, knowledge, and training, that would enable their cell to function efficiently, thus forcing them to play "catch up" and organize against the threat.[15] The follow-on RCT however, quickly adopted the RCT-1 C-IED structure and continued to operate along the same methodology.[16]

The organization of the RCT-1 C-IED Cell was an evolutionary process and one that did not occur overnight. For the majority of its members, their role within the C-IED cell was a collateral or secondary responsibility to their originally assigned billet. The implications of which will be addressed later on in the paper to analyze the applicability of the RCT-1 C-IED cell model to future tactical situations. The initial challenge was to understand in which areas to focus, who should perform them, and what enablers were required to augment and fill gaps of knowledge and expertise. In the word of the C-IED Operations Integration Cell (COIC) Comprehensive Look Team (CLT) leader assigned to RCT-1, "because of the vast mix of personnel from civilians to different military services and MOS's, the cell was primed for chaos."[17] Figure 2 below represents the final organizational structure of RCT-1 CIED Cell. See Appendix A for a full description of the RCT-1 C-IED cell billet responsibilities.

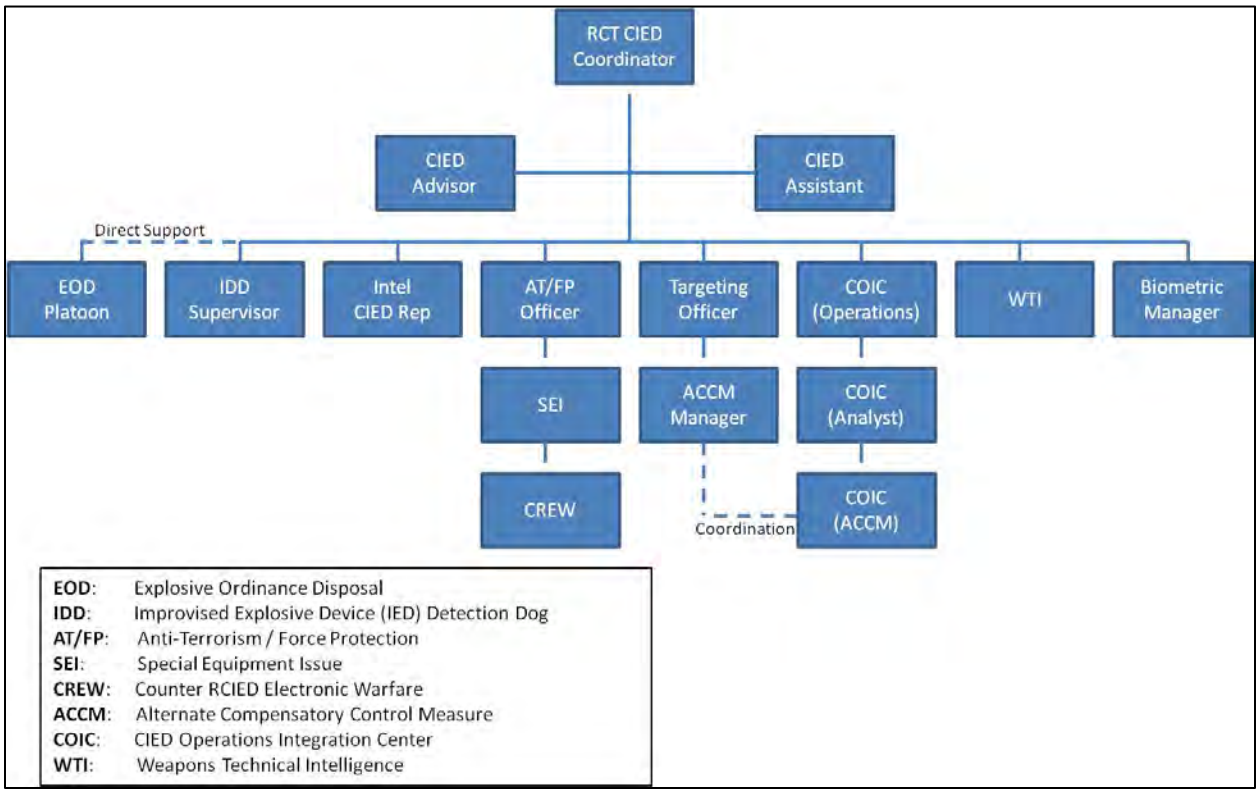

Figure 2. RCT-1 C-IED Cell Organization

Integration of C-IED Enablers

In order to achieve a combined arms effect throughout the three C-IED LOO's, it was essential to integrate as many C-IED enablers at the disposal of the unit's cell as possible. Other units observed in Afghanistan by the Marine Corps Warfighting Labs (MCWL) C-IED Division, "looked at the IED problem as a separate entity from their lines of operations, and didn't try to integrate enablers into the traditional staff sections."[18] A primary issue involved in achieving complete integration is an inadequate understanding of the assets available, their mission, and capabilities.[19] Some of these enablers may be "pushed" to the individual unit, while others may need to be requested, or may only be available for a limited duration. In the case of RCT-1, the C-IED cell sought out and requested multiple enablers throughout the deployment. In addition to the enablers listed within Appendix A that provided a persistent presence within the cell, an example of the RCT's integration can be observed with their utilization of Joint Expeditionary Teams (JET), Combined Explosive Exploitation Cell (CEXC), and Field Service Representatives.

Joint Expeditionary Team (JET):

Originally established under the title Marine Training and Advisor Team (MTAT), JET was renamed by JIEDDO with the mission "to embed with units during combat operations in order to observe and collect best practices and [Tactics, Techniques, and Procedures] TTPs."[20] Operating along the Train the Force LOO, JET's are normally comprised of two to three person teams OPCON to the Task Force C-IED Commander.[21] They provide highly skilled, prior military service members to embed with maneuver units to observe and analyze unit C-IED TTP's both in the threat environment and within the C-IED cell itself. Providing guidance and feedback to individual Marines and unit commanders, JET members are able to disseminate both

friendly and enemy TTP's and best practices that are specifically suited for that particular area of operations.

Within the RCT-1 deployment, JET's were uses to evaluate and refine battalion C-IED TTP's and allow for the cross pollination of the best practices between units. Based on the experience gained through multiple battalion reliefs in place (RIP's) the recommended usage of JET was three, two week embed missions per battalion. Embed missions should occur at the beginning, middle, and end of each battalion rotation in order to achieve the greatest effect on TTP evaluation and dissemination. Due to JET being a high demand enabler this schedule however, was not always possible. Critical to the success of any JET embed mission was the prior planning and coordination of effort to ensure their limited time was maximized.

Combined Explosive Exploitation Cell (CEXC):

"CEXC provides technical intelligence on IED construction and techniques to order to identify trends to be utilized to attack the IED Network."[22] As discussed in more detail in Appendix B, RCT-1 had a Weapons Intelligence Team (WIT) liaison provided by CEXC in order to facilitate the dissemination of enemy TTP's and the effective exploitation of IED's and their components. Based on the ground scheme of maneuver during RCT level operations, the C-IED Cell would develop a concept of support that included the utilization of additional CEXC personnel. Although unable to provide continuous support due to manpower limitations, on numerous occasions CEXC was able to fulfill RCT-1 C-IED Cell requests for specific operations. The augmentation of CEXC teams, allowed for specifically trained individuals to fulfill the exploitation duties, thereby freeing up individual Marines to focus on the mission and task at hand.

Field Service Representatives (FSR's):

FSR's, or civilian contractors as they may be referred to, were essential for the continued daily operations of technologically sophisticated pieces of equipment. In some cases such as the Persistent Ground Surveillance System (PGSS) or "Aerostat", the manning and operation of such systems were run solely by civilian providers. The integration of these individuals into the inner workings of the tactical level C-IED cell was essential for a shared common understanding of the threat environment and the most efficient use of the asset. A close and integrated relationship with FSR's provided increased training, streamlined maintenance procedures, and maximized effective utilization of the equipment.

The RCT-1 C-IED cell understood the benefit of FSR integration and included them within the working groups and meetings, allowing them to participate and offer solutions to issues specific to their field. Close integration with the IED Detection Dog (IDD) FSR led to the establishment of a sustainment training course resulting in healthier dogs and increased IED finds throughout the area of operations. Similarly, in working with the Ground Based Operational Surveillance System (G-BOSS) FSR's, a training academy was initiated both for incoming and existing units which increased the usage of the system's full capabilities.

The defined roles of the organizational structure (Appendix A) and integration of enablers within the RCT-1 model facilitated the efficient dissemination of information and understanding of the threat environment. This provided all participants a common operational picture within the assigned area of responsibility. This structure came at a high personnel tax to the unit however. As described in Appendix A, nearly each billet was a collateral duty to the normally assigned position of the individual. Sometimes individuals had up to three additional responsibilities within the C-IED cell. Based on the current overall threat assessment, the risk associated with "spreading the staff" must be considered in contrast to the expected return. In

the case of RCT-1, the high threat of IED's warranted the assignment of additional responsibilities.

RCT-1 C-IED Battle Rhythm

Throughout the course of the deployment the RCT-1 staff developed a robust battle rhythm focused along four Lines of Operations (LOO's). As a subset of the RCT's Security LOO, the C-IED cell developed their own internal battle rhythm which evolved over the course of the deployment, generally growing in scope as the cell matured and fully embraced the integration and coordination of additional enablers. Table 1 illustrates the final schedule of reoccurring events coordinated by the C-IED Cell. While *MAGTF C-IED Operations* discusses the need for a C-IED battle rhythm, it does not provide an example to follow or deviate from. The following summarizes the key events, but as before, the ACCM portion will not be discussed in detail due to its restrictive nature.

Day	Time	Event
Daily	N/A	Significant Events and EOD Reports review
Daily	N/A	ACCM Operations
Tuesday	N/A	Preparation for CIED Working Group
Wednesday	1030-1230	RCT-1 C-IED Working Group
Wednesday	1500	Dissemination of RCT-1 C-IED Working Group Slides
Thursday	1500-1600	RCT-1 C-IED Video Teleconference (VTC)
Friday	1600-1700	Division C-IED
Friday	1700-1730	MEF ACCM Video Teleconference
Sunday	1300-1500	RCT-1 ACCM Working Group
Weekly	N/A	IDD Training Update (Active Courses)
Monthly	N/A	IDD Report collected and submitted
Monthly	N/A	Enhanced C-IED Training for Incoming Bn's
Quarterly	N/A	Enhanced C-IED Training for NCO Symposium

Table 1. C-IED Battle Rhythm

On a daily basis throughout the week, members of the C-IED cell would review the IED related significant events and the resulting EOD reports issued by the Direct Support EOD platoon. In the reporting, deviations in enemy or friendly Tactics, Techniques, and Procedures (TTP's) and their resulting actions would be noted, as well as indications of reoccurring trends. Collected primarily by the C-IED Coordinator, EOD Platoon Commander, and RCT Intelligence section, these trends and new TTP's would feed into the overall C-IED Working Group agenda. Conducted once per week, the C-IED Working Group became the main effort and the true integration and coordination forum for the cell. Lasting up to two hours in duration, the working group was structured along a recurring agenda, but fostered an open forum and dialogue. The working group presented all the participants listed in Table 2, an opportunity to discuss issues related to their specialty in order to integrate their efforts into the overall combined arms approach. The end result of the working group was a list of tasks, requests for information, staff estimates of support for future C-IED initiatives, and decision points for the Commanding Officer. The overall brief was then refined and provided electronically to subordinate units.

Working Group Participants		
RCT Operations Officer	Intelligence Officer	CLB Intelligence Officer
Future Operations Officer	Intelligence NCO (CIED)*	MWD Handler
Current Operations Officer	Targeting Officer*	IDD Contractor
CIED Coordinator*	ACCM Manager*	CEXC Representative
CIED Advisor*	COIC Operations LNO*	JET (if available)
CIED Assistant*	COIC Analyst*	Motor Transport Officer
EOD Platoon Cmdr*	JIEDDO WTI*	Logistics Officer
IDD Supervisor*	Biometric Manager*	Route Clearance Co Cmdr
AT/FP Officer*	Information Officer	Collections Officer
SEI Manager*	MISO Det OIC	LEP
EWO*	GBOSS Contractors	CITP

* Annotates Core CIED Cell Member

Table 2. C-IED Working Group Participants

The efforts of the RCT C-IED Cell fed directly into the three Video Teleconferences (VTC's) hosted by the RCT and Division C-IED Cell. As opposed to the RCT Working Group, only the core members of the cell (see Table 2) participated in the VTC's for purposes of efficiency. The RCT held a VTC with the subordinate battalions the day following the working group focused on new or emerging IED trends, training and equipment updates, and future C-IED initiatives. This also provided the battalions sufficient time to assimilate the information and findings from the published RCT working group, answer RFI's, or develop their own set of questions to direct towards the RCT cell. The Division C-IED VTC the following day was primarily used to request and receive updates for support, and to discuss future C-IED initiatives. Because the RCT-1 had invested the two previous days discussing the C-IED issues amongst both the RCT and battalion staffs, they were able to provide higher Headquarters with a more accurate understanding of the IED threat environment.

The end result of the C-IED battle rhythm was a streamlined, collaborative, and integrated sharing of information throughout the different levels of command. As described by the EOD Platoon Commander concerning the C-IED working group and battle rhythm, "every section within RCT-1 was represented, and participation of enablers and FSR's were highly encouraged, ultimately resulting in optimal input, knowledge, and creativity."[23] Throughout the deployment, the RCT was able to reduce the IED strike ratio by 19 percent, (see also Figure 2) while simultaneously expanding Marine presence within the battlespace.[24] While it is impossible to attribute the results directly to the C-IED cell, the RCT Commanding Officer believed the success was due in part to the integrated combined arms approach "that leveraged the capabilities of the entire Joint Force present in the AO."[25]

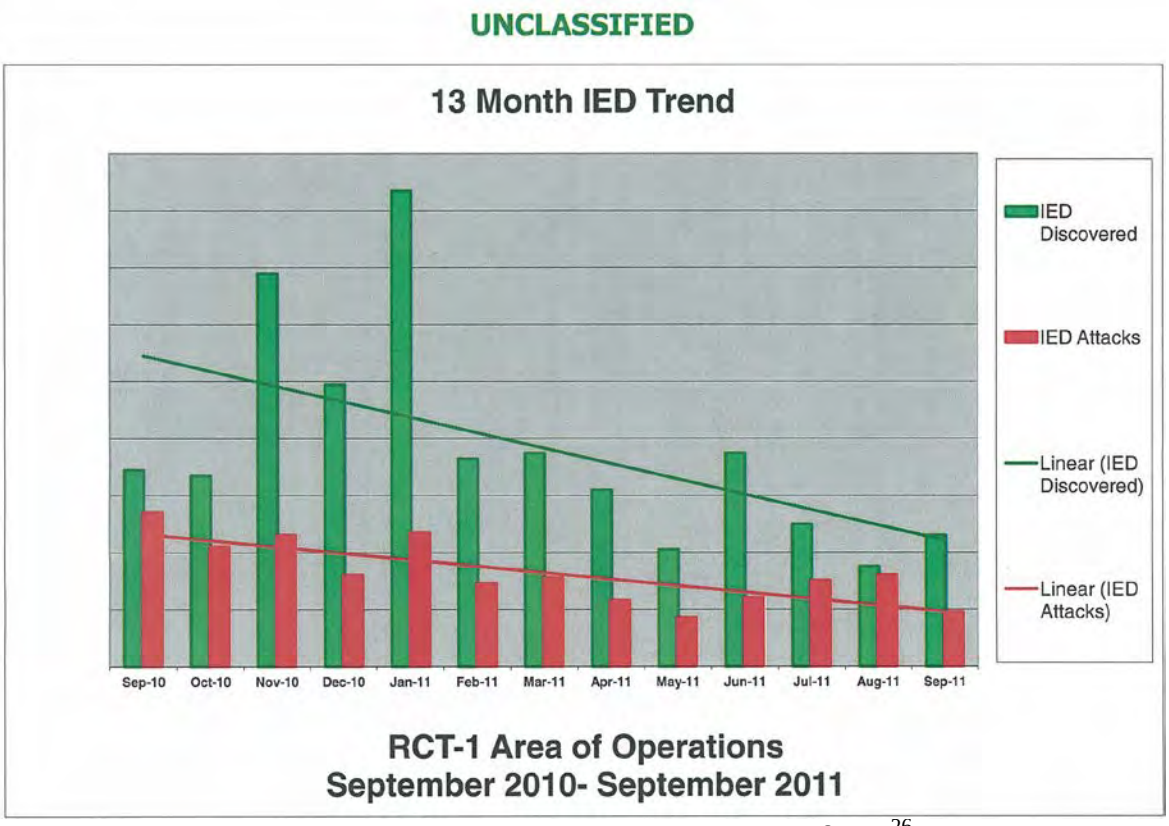

Figure 3. RCT-1 C-IED Trends (Unclassified) [26]

RCT-1 C-IED Cell Comparison to Current USMC C-IED Doctrine

As discussed initially, prior to the RCT-1 deployment, the Marine Corps did not have the doctrinal foundation for the organizational structure of a tactical level C-IED cell. The development of what would become *MAGTF C-IED Operations*, bridged the gap of knowledge and provided a model in which to organize.[27] By the time it was released at the end of January 2011, the RCT-1 organizational structure had solidified. A comparison between the RCT-1 model and the current interim doctrine (Table 3) yields three primary conclusions. First is the fact that despite being developed independently, many of the same positions were created to counter the threat. Although applying a slightly different naming conventions to the titles, the positions are similar in responsibilities.[28] The second conclusion is that both models are manpower intensive in order to effectively apply a holistic approach to the threat. *MAGTF C-IED Operations* recommends a 15 person cell, while RCT-1 model is even larger at 19. In

relation to the actual participants of the RCT-1 C-IED working group, the number jumps to 30-35 individuals. The RCT-1 model was developed for a high IED threat environment but could be tailored as the threat and mission require. In reality, RCT-1 filled the 19 positions with 16 individuals due to manpower limitations. The total number could be further reduced by assigning multiple positions to more individuals. The personnel intensive nature of the cell leads to the last conclusion, which is the requirement for outside augmentation, specifically civilian contractors. In both models, civilians made up approximately 30% of the cell and provided specialized skill sets not resident within the Marine Corps. As discussed previously, understanding the capabilities and limitations of the C-IED enablers, is fundamental for their effective integration and employment. The commonalities found between the two models, lends credibility to *MAGTF C-IED Operations* as an effective doctrinal foundation for future units to apply. Table 3 shows a side by side comparison of the two models. While they hold striking similarities, there are several differences that are worth identifying for discussion.

MCIP 3-17.02 C-IED Cell Recommendation for MEB/RCT		
Billet	**Rank**	**MOS**
C-IED Cell OIC	O-4	8006
C-IED Deputy	O-3/CWO4	2305
EWO or CREW Chief	O-2/E-6	8006
C-IED Chief	E-7	8014
EOD Chief	E-7	2336
AT/FP Officer	E-6	8014
CEXC Liaison Officer	E-6	8014
Intelligence Analyst	E-5	0231
Watch NCO	E-5	8014
Watch NCO	E-5	8014
ORSA Analyst	CTR	CIV
COIC Comprehensive Look Team Ldr (CLT)	CTR	CIV
COIC Comprehensive Look Team Ldr (CLT	CTR	CIV
CITP Analyst	CTR	CIV
LEP	CTR	CIV
Total Personnel	**15**	

RCT-1 OEF 10.2 C-IED Cell			
Billet	**Rank**	**MOS**	**Primary Billet**
C-IED Coordinator	O-4	0802	RCT FSC
C-IED Advisor	CWO4	0306	RCT Gunner
EWO	CWO3	5702	CBRN Officer
C-IED Assistant	E-5	0861	Fire Support Man
EOD Platoon Cmdr	CWO2	2305	
AT/FP Officer	CWO3	5702	CBRN Officer
CEXC Liaison Officer	E-7	0369	WIT
Intelligence Analyst	E-5	0231	
Watch NCO	N/A	N/A	Not Filled
Watch NCO	N/A	N/A	Not Filled
ORSA Analyst	CTR	CIV	
COIC Comprehensive Look Team Ldr (CLT)	CTR	CIV	
COIC Comprehensive Look Team Ldr (CLT)	CTR	CIV	
CITP Analyst	CTR	CIV	
LEP	CTR	CIV	
IDD Supervisor	E-8	0369	RCT A-Ops Chief
SEI Manager	CWO3	5702	CBRN Officer
Targeting Officer	CWO2	0813	
ACCM Manager	CWO2	0813	Targeting Officer
COIC Analyst (ACCM)	CTR	CIV	
Biometric Manager	O-2	0602	RCT IMO
Total Personnel *(Does not include Dual Billets)			**19**

Table 3. *MAGTF C-IED Operations* and RCT-1 Comparison [29]

ACCM Manager: Under the recommended *MAGTF C-IED Operations* organization, an ACCM Officer and Chief are located at either the MEF or Division, but are not included at either the RCT or battalion level.[30] Due most likely to the restrictive nature of the program itself, this recommended structure is flawed. The result is a disjointed and misunderstood capability. RCT-1 expanded ACCM operations to include a dedicated COIC analyst, and required each battalion to appoint an individual responsible for the management of their unit's program. Once the necessary personnel, equipment, and working groups were formalized at the RCT and battalion levels, ACCM operations increased in frequency and success rate. Due to the decentralized nature of the counter insurgency fight, the capability must exist down to the battalion level. If ACCM operations are going to be effective, appointed ACCM Managers must exist at the level at which the program is employed.

SEI Manager: Not listed under the recommended doctrinal structure, RCT-1 believed it was necessary to appoint a Special Equipment Issue (SEI) Manager (see also Appendix A) to deal with the daily maintenance management and procurement of additional specialized equipment. Due to the rapid fielding of new technologies, this billet requirement was directly related to duration of the war and the mature nature of the theater. In future conflicts, it is unlikely that this billet requirement will have to be filled, at least initially. If necessary, two different options could be used: 1) Although not falling under traditional USMC supply and maintenance activities, establish it as a collateral duty for the logistics section working in close coordination with the AT/FP officer; 2) Establish the responsibility under the AT/FP officer as a collateral duty as RCT-1 did.

Biometric Manager: With the growing capabilities of battlefield exploitation and forensics through handheld biometric enrollment devices, CEXC, WIT, and the Joint Expeditionary Forensic Facility (JEFF), it is necessary to have personnel well versed in the

proper employment and processes. Not listed under the doctrinal recommendation, the Biometric Manager unifies the overall program for the command. Until the appointment of a dedicated Biometric Manager, the RCT suffered from a disjointed understanding of employment, processes, and capabilities. With the increase in technology and growing reliance on biometric enrollments to map the human terrain, a dedicated subject matter expert will be necessary in future conflicts.

The Global IED Threat and Future C-IED Operations

With an established withdrawal timeline from Afghanistan set for 2014, and the looming budgetary cutbacks for the department of defense, the future of the C-IED operations will continue to evolve as the DoD organizes and postures for the future. Currently there is an ongoing debate as to what C-IED operations will look like in a post OEF environment. Retired Colonel Jermiah Canty, states that, "on one hand there are those who think that the danger of the weapons system is so dire that it warrants special attention and dedicated resources, while others believe that countering IEDs is a lesser included case of counterinsurgency."[31] In order to determine the relevance of future C-IED operations, one must consider not only the current threat, but also the future operating environment.

Global Threat:

Looking first at a threat based assessment, the future conflicts the USMC is likely to encounter will involve the continued employment of IED's as an inexpensive and effective means by a numerical and technological inferior force, to produce a strategic effect.

The current IED threat is not limited solely to Iraq or Afghanistan. Viewed on a global scale from January to November 2011, a total of 6,832 IED events occurred in 111 countries outside of OIF or OEF theaters, and produced a total of 12,286 casualties.[32] From October 2010 to October 2011, IED's made up 38.4% of all terrorists events and accounted for 53% of all

terrorist casualties worldwide.[33] The continued proliferation of IED's is assisted by globalization, the internet, and social media, "allowing threat networks to easily spread IED technology."[34] IED components such as fertilizer to make homemade explosives, or radio controlled triggers, remain cheap and readily available for criminal, insurgent, or terrorist organizations to construct IED's using "off the shelf technology."[35] Additionally, the lethality of future IED's are also expected to increase. The U.S. National Intelligence Council (NIC) future analysis, *Global Trends 2025: A Transformed World*, describes the potential for even "more capable" IED's in the future due to the "spread of cheap sensors and robotics."[36] The combination of availability (resources) and capability (training) provide future terrorists, insurgents, or irregular forces with the means to conduct attacks using IED's. For these reasons, *JIEDDO's Strategic Plan for 2012-2016* assumes "an enduring global IED threat will drive Combatant Commander requirements for C-IED capabilities" in the upcoming years.[37] (See also Appendix B for a global IED threat graphic)

Future Operating Environment:

Areas of instability will continue to remain high IED threat environments for the foreseeable future. The DoD's latest strategic guidance, *Sustaining U.S. Global Leadership: Priorities for the 21st Century Defense*, lists counter-terrorism, stability, COIN, and irregular warfare as primary future missions for the U.S. Armed Forces.[38] In addition, the new strategic guidance calls for additional cooperation between the U.S. and its allied or partnered states to promote global security. The combination of these two factors will require the continued deployment of U.S. Forces to areas of instability where potential IED threats exist.

The *JIEDDO Strategic Plan 2012-2016*, states that the geographic areas most likely to contain an IED threat share common characteristics such as "weak governance and the absence of rule of law, corruption, mass migration, poverty, illiteracy, high unemployment, large

populations of disaffected youth, and competition for water, food, and natural resources."[39] When compared against the *Marine Corps Vision and Strategy 2025*, these are some of the same areas the Marine Corps expects to conduct "complex expeditionary operations" such as "counterinsurgency; counterterrorism; train, advise, and assist activities; and stability tasks."[40] While the *Marine Corps Vision and Strategy 2025* recognizes "state-on-state warfare" as being the most dangerous future threat to the U.S., it asserts that hybrid conflicts in which adversaries will use irregular tactics in an attempt deny the U.S. "access and freedom of action" to be the most likely. [41] This analysis of the future operating environment is further supported by the NIC's assessment, *Tomorrow's Security Challenges: The Defense Implications of Emerging Global Trends*, that points to the "rise of non-state networks" as a future scenario in which a lack of state capacity gives rise to organizations that fill the void, presenting "a myriad of security challenges involving sub-national and transnational entities."[42]

Due to its global proliferation, cost, availability, simplicity, and observed effectiveness against U.S. forces over the past 11 years, IED's will continue to be used against the USMC in future conflicts. In his opening remarks to the recent USMC C-IED Operations and Advisory Group (OAG), the Commanding General of USMC Combat Development and Integration (CD&I), Lieutenant General Mills stated, "we will see this weapon [IED's] again during the next 15-20 years," and described Africa and the Philippines as likely threat areas.[43] With historical examples of IED employment providing an enduring trend, and future analysis pointing to a continuation of the threat, it becomes imperative to maintain and build upon the C-IED lessons learned from OEF and OIF. Sustaining a service wide focus on C-IED operations will increase mobility, decrease casualties, and reduce an enemy's ability to exploit the strategic effect of IED's in future conflicts. An examination of the RCT-1 C-IED cell model provides a useful organizational structure for future units to emulate in order to achieve a combined arms

effect. Additionally, the lessons learned from the RCT-1 experience highlight the requirement for future changes within the C-IED field and how the USMC integrates it into training.

Personnel Manning:

Personnel manning of the C-IED Cell was and will continue to be one of the most critical issue. Of the 19 individuals within the RCT-1 cell, six were civilian contractors. During the initial operations of a future conflict, the austere, mobile, and unsecure nature of hostilities may preclude contractors from being available because of excessive risk. Additionally, every military member of the cell with the exception of the EOD Platoon Commander and the Intelligence Analyst, were fulfilling secondary or tertiary collateral duties. In this case, the character of the next conflict may prevent such individuals from being capable of breaking away from their primary duty and responsibilities. The logical choice then would be to have dedicated individuals assigned those roles as their sole primary billet, as recommended by the former 1st Marine Division C-IED Officer when reviewing the RCT-1 organization.[44] *MAGTF C-IED Operations* already advocates this approach as evident by their manpower sourcing methodology for their recommended cell composition. The publication states that the required C-IED personnel to establish the tactical level cells at the RCT and below, will come from the Marine Expeditionary Force (MEF). It is unclear, however, as to when the proposed augmentation would be provided and whether the additional personnel would require at Table of Organization change for the MEF, or would be taken out of existing force structure. Assuming that the augmentation only occurs within the realm of a high IED threat environment, it would require the MEF to provide 81 individuals to fill three RCT's within a division sized Ground Combat Element (GCE), not to include the proposed additional augmentation to Logistics Combat Element (LCE) and Aviation Combat Element (ACE).[45] Any Table of Organization change will likely encounter opposition in light expected military downsizing due to financial constraints. In

the meantime, there is currently an initiative to provide three dedicated C-IED trained personnel to each maneuver unit down to the battalion level.[46]

With personnel limitation in mind, this paper assumes that like RCT-1, the burdens of providing the majority of the personnel to staff future C-IED cells will fall largely on the unit itself. Future units must therefore be better trained and organized if they are to execute the combined arms C-IED methodology this paper advocates. The next U.S. conflict may not contain the extent of the IED threat previously faced in Iraq or Afghanistan, but forces must be trained and equipped to deal with them should the requirement arise. The C-IED operations of the future must be flexible, and scalable to react to the changes in the operational environment. The lessons learned over the past 11 years must be sustained and continue to be integrated into training. This paper proposes four recommendations to increase C-IED training, proficiency, and to further institutionalize the concept of an IED threat: 1) dissemination of C-IED training resources, 2) creation of a C-IED coordinator course, 3) refined integration of C-IED T&R's, and 4) adapting a CBRN model for C-IED.

C-IED Training Resource Listing:

One of the most pressing issues, but also one of the easiest to correct, falls under the category of information management. Due to an overall lack in subject matter expertise, units are not aware of the vast C-IED training resources available from the Marine Corps and JIEDDO. JIEDDO routinely conducts after action interviews with recently deployed units (Army & Marine Corps) in an attempt to understand how the unit operated, what challenges were encountered during training and deployment, and how to improve C-IED operations. After conducting 29 such interviews, Sean McCann a JIEDDO Joint Center of Excellence (JCOE) staff member, said the number one recurring issue is that units are not aware of the C-IED courses and enabler support available to train with in preparation for deployment.[47] According to McCann,

units often complain about the lack of information during interviews saying "we don't know, what we don't know."[48]

While the information regarding all the C-IED training resources does exist, it is largely only resident in the knowledge of C-IED subject matter experts, and has not filtered down into the operating forces. Correcting this deficiency within the Marine Corps would involve a coordinated effort between the Marine Corps Warfighting Lab (MCWL), Training and Education Command (TECom), and JIEDDO. As a Joint enabler, the full catalog of JIEDDO courses must be combined with existing Marine Corps training opportunities to provide the Commander a menu of options to draw from based on the anticipated threat. Integrating the information into doctrinal publications would be beneficial, however, due to the staffing time required for doctrinal updates, it would not be responsive enough in the short term. The most feasible solution is a consolidated brief or pamphlet designed for rapid dissemination amongst the force. Such a simple solution of fixing what equates to an information management problem, would immediately improve utilization or C-IED resources. Additional venues to educate Marine Corps leaders on C-IED training opportunities could include the Commanders' Course held in Quantico, or locally ran Range Safety Officer (RSO) courses. Both options provide a captive audience interested in future training opportunities.

C-IED Coordinator Course:

As described previously, the fundamental aspect that made the RCT-1 model successful, was the holistic approach that attempted to integrate every warfighting function and enabler in order to counter the IED threat. The challenge for the leadership within a future C-IED cell, is to possess a well rounded understanding of the limitations and capabilities of all the resources at their disposal. Nowhere does this become more important, than in the billet of the C-IED Coordinator. By the very nature of the title itself, the coordinator must be capable of effectively

merging all staff and functional areas. This responsibility requires an in-depth C-IED knowledge base to comprehend the mutually supporting relationships between the resources. In contrast to the RCT-1 C-IED case study, the Coordinator should develop a comprehensive understanding prior to deployment in order to maximize time, and potentially save lives. For this reason, the Marine Corps needs to develop a C-IED Coordinator Course.

The Marine Corps has now become more prescriptive in C-IED training requirements in preparation for deployment. The recently released USMC PTP C-IED training message for the USCENTCOM area of responsibility, lists the C-IED requirements for deploying units. The message was released in December of 2011 in response to what it referred to as "disparities in the numerous C-IED training resources available and sourced by USMC/Joint Forces in pre-deployment training and a lack of service pre-deployment C-IED training policy/guidance have led to gaps in training and capabilities readiness among these forces."[49] The message primarily addresses individual user, and more advanced subject matter expert requirements per deploying unit, but does not offer a course to unify the efforts within an overall C-IED concept of operations.

The most similar period of instruction to the proposed C-IED Coordinator Course is the one week Attack the Network (AtN) course currently offered by Marine Corps Tactics and Operations Group (MCTOG). While the course has improved the understanding of the threat networks, it still only deals with one aspect or line of operations for the C-IED fight. Originally, the AtN methodology was focused specifically on the C-IED effort in order to "identify key leaders, facilitators, and emplacers so that they could be captured or killed."[50] The goal was to move "left of the boom" or in other words, stop the attack before the IED was emplaced. AtN has now evolved outside the C-IED realm and into a more comprehensive COIN framework where C-IED is nested within overall operations. In a review of the AtN course, the curriculum

does briefly describe some Defeat the Device (DtD) capabilities such as CREW, and the course itself would constitute a Train the Force (TtF) capability, but in the end, it lacks an overall comprehensive combined arms C-IED approach.

An individual could attempt to make the argument that, if one could successfully attack the network itself and prevent the emplacement of IED's, then the other two LOO's (DtD, and TtF) would not be required. While a lofty goal, a complete understanding of the threat network at the opening of hostilities, or at any time after is highly unlikely, and would therefore require the integration of the additional LOO's to effectively counter the threat. A C-IED Coordinator Course would effectively combine all three C-IED LOO's and look at the threat from every angle. Developed with the assistance and oversight of JIEDDO, the course would likely be approximately three weeks in duration and cover the topics such as those listed in Table 4. With a wide variety of topics to cover, the intent would not be to make the C-IED Coordinator an expert in each field, but to provide a well rounded understanding on the correct employment and integration of each asset. Each treated as a potential weapon system in the C-IED fight, the coordinator's job would be to create the combined arms effect.

JIEDDO Organization	COIC	Convoy Operations
USMC C-IED Organizations	COIC Tools	Route Clearance Integration
C-IED LOO's	JET	Route Clearance Vehicles
WTI IED Lexicon	CEXC	EOD Operations
IED Components	JEFF	Robots
IED Reporting Requirments	JPEC	Road Repair Operations
Biometrics Principles	CITP	Culvert Denial Systems
Biometric Systems	ORSA	C-IED Training Lanes
Biometric Databases	Dismounted CREW	Web Based Resources
IDD/MWD's	Airborne EW platforms	Measures of Effectiveness
ISR Integration	Vehicle CREW	C-IED Reports
Metal Detectors	LEP Integration	C-IED Working Group
Ground Penetrating Radar	WTI/WIT	C-IED Battle Rhythm
Threat Financing	Dismounted Movement	Emerging Technologies
Unmanned Ground Sensors	STO Programs	ACCM Programs
Ground Based Persistence Surveillance	TSE/Evidence Handling and Routing	Vehicle Capabilities MRAP/MATV

Table 4. Recommended C-IED Coordinator Classes (Created by author)

Refined C-IED T&R Integration:

Per MCO P3500.72A, the Marine Corps Ground Training and Readiness (T&R) Program is designed to "establish training standards, regulations and policies regarding the training of Marines and assigned Navy personnel in ground combat, combat support, and combat service support occupational fields."[51] When examining the attention the manuals apply to the threat of IED's, there currently exists a disparity among differing types of ground units. While it can be argued that this is the result of differing mission sets among units, it does not adequately address the non-discriminatory threat IED's pose to all units operating within the battlespace. A primary example of this inadequacy is found within the current USMC Artillery T&R manual. In over 1300 pages describing in detail, artillery training tasks, IED's are mentioned once in an appendix in relation to an online course.[52] For a ground combat unit that relies on mobility in order to accomplish its primary mission, the lack of attention should raise concerns in light of the threat IED's pose to ground lines of communication. Similarly, the Assault Amphibian T&R manual never lists any C-IED tasks or makes mention of IED threats.[53] While it does however list mine clearing operations, it is in the context of the deliberate breeching of obstacles and not necessarily the threat of an IED. Even in occupational specialty T&R manuals that do have C-IED tasks, they are sometimes incorrectly or indiscriminately applied. In the Light Armor Reconnaissance T&R manual, no C-IED tasks exist for the battalion or company, yet a platoon has task LAR-MOBL-5111, to "Conduct an Improvised Explosive Device Patrol."[54] To direct a subordinate unit to essentially find all IED's along a route, should require appropriate higher level staff action to integrate all intelligence and C-IED enablers; a task which is missing in this case.

All these examples point to the fact that C-IED specific tasks both at the individual and unit levels are not fully integrated within current T&R standards. Due to the complex nature

and sheer size of many of the T&R manuals, they are not modified and republished overnight. The process is lengthy and requires the input and coordination of multiple individuals and commands. What is now required, is an increased emphasis on the proper integration of specific C-IED tasks within all T&R manuals on all current and future modifications. Because of the holistic approach required to successfully counter the threat, collective staff level tasks need to be inserted to ensure they are capable of integrating and coordinating combined arms C-IED operations.

The opening of each separate USMC T&R manual is nearly identical. Within Chapter 1, the T&R manual describes training management, evaluation requirements, event coding, and overall application. Also resident in the beginning of each manual, are the conditions under which Marines must be capable of executing their T&R tasks, specifically, operating within a CBRN environment. CBRN training is written as a standardized statement found within each separate occupational specialty T&R manual and emphasizes the requirement to integrate CBRN into as many training events as possible. Taken from one of the most recently updated USMC T&R manuals from May 2011, the standardized CBRN statement reads as follows:

> 1. All personnel assigned to the operating force must be trained in chemical, biological, radiological, and nuclear incident defense (CBRN), in order to survive and continue their mission in this environment. Individual proficiency standards are defined as survival and basis operating standards. Survival standards are those that the individual must master in order to survive CBRN attacks. Basic operating standards are those that the individual, and collectively the unit, must perform to continue operations in a CBRN environment.
>
> 2. In order to develop and maintain the ability to operate in a CBRN environment, CBRN training is an integral part of the training plan and events in this T&R Manual. Units should train under CBRN conditions whenever possible. Per reference (c) [CBRN Defense Training Requirements] all units must be capable of accomplishing their assigned mission in a contaminated environment.[55]

In addition to the above statement, current USMC T&R manuals also list the requirement to perform their mission during night/limited visibility, advocating that it should actually take

precedence over day light training when available time is limited.[56] Viewed through the lens of force protections, the capability to operate and perform their primary mission within an IED threat environment should be as fundamental a training consideration as CBRN and limited visibility (night) training. The addition and integration of a similar IED/C-IED statement to all T&R manuals will assist in institutionalizing the threat concept, and subsequent requirement to incorporate it into all training events instead of merely viewing the problem as a recent trend. Viewing IED's as a fundamental aspect of the threat environment and fully integrating it into training events will better prepare Marines to operate in "every clime and place."

CBRN & C-IED:

Increased C-IED training and T&R refinement offer a mid-range solution to institutionalize the IED threat. Another option having longer term effects was presented by Lieutenant Colonel Jeffrey Miller, Director of the MAGTF Engineering Division at the Marine Corps Engineer Center (MCEC). He has proposed a C-IED model similar to the current Chemical, Biological, Radiological, Nuclear, Defense (CBRND) methodology.[57] This new proposal offers an affordable alternative to maintaining C-IED proficiency through equipment maintenance, training, and organization, by expanding the CBRN military occupational specialty (MOS) to include C-IED responsibilities.

During COIN operations in Iraq and Afghanistan, U.S. Forces have not faced a CBRN threat, yet the necessary protective equipment and subject matter expertise are available in theater should the need arise. Likewise, the Marine Corps has maintained annual individual and unit CBRN training requirement in order to be prepared for the possibility of a threat. Modeling C-IED operations after CBRN defense mandated annual training classes and ranges will create and sustain the proficiency required to combat future IED threats instead of relying primarily on Pre-deployment Training Preparation (PTP).

This new outlook and organization will not necessarily negate the need to form a tactical level C-IED cell. It instead, provides the commander with organic C-IED capabilities in the form of subject matter expertise, training, and equipment. As the IED threat increases, a scalable response could mean the activation of the cell along with the distribution of pre-stage equipment. Existing CBRND Officers, would attend a Joint, secondary MOS producing school hosted by JIEDDO. This would take the place, and expand upon the concept of the C-IED Coordinator Course proposed previously. Once deployed they would lead the unit's C-IED fight as either the coordinator, or deputy depending on the sourcing of additional augmentation to the cell.

C-IED Investment:

The proposed recommendations will come at a cost of resources, yet the alternative of not sustaining and improving upon our C-IED skills will be a much greater charge. Over the past two conflicts, the U.S. has displayed its susceptibility to IED's while conducting dispersed operations, and has provided adversaries with a blueprint to counter U.S. tactical mobility. To cease future training and development of C-IED operations, will once again expose the military's "soft underbelly" and cost unnecessary human capital, equipment losses, and maneuverability on the battlefield, thus requiring previous lessons to be relearned in a time sensitive environment. This paper's recommendations offer a future investment to effectively counter the threat.

As a non-standing organization, the C-IED cell model presents a flexible and cost effective method to integrate all warfighting functions and enablers once an IED threat emerges. Having selected individuals, such as the C-IED Coordinator formally trained beforehand, provides maneuver commanders an organic capability and enables rapid mobilization and further training of the cell. Further T&R integration and required annual training, ensures C-IED skill sets remain current, not only for the individual, but also for the staff directing the actions. As a USMC core competency, the combined arms methodology offered by the cell, allows for the

most effective means to attack the problem from every angle, using every weapon at its disposal. It is this fundamental concept that drives the operation of the cell in order to reduce the threat of IED's. Due to its wide range of subject matter expertise participation, the cell can additionally facilitate refined ISR integration, kinetic/non-kinetic targeting, human terrain mapping, and TTP development. The RCT-1 model represents one solution to a complex problem, and can be further tailored as technology and the threat evolve.

Conclusion

The threat of IED's will not disappear with the withdrawal of U.S. Forces from Iraq and Afghanistan. The USMC and Joint community have recently made significant strides in developing the doctrine needed to provide the foundation of knowledge needed for the formation of tactical level C-IED cells. Up until the publication of *MAGTF C-IED Operations*, USMC units relied heavily on previous experiences, and the minimal guidance they received prior to deployment. RCT-1's recent experience in Afghanistan, to a large degree, validates the recommended model presented by *MAGTF C-IED Operations* as an effective means to counter the IED threat, yet also calls for additional capabilities within the cell. As an interim publication, refinement is still required to take full advantage of combined arms C-IED methodology. As RCT-1 demonstrated, the full integration and synchronization of all staff sections and enablers simultaneously operating along all three C-IED LOO's provides the greatest potential for success. Fiscal constraints and manpower limitations will pose challenges to future C-IED cells. The tactical level C-IED cell of the future and will need to be flexible, and scalable to effectively counter the threat. In order to fully harness the benefits of combined arms C-IED methodology, additional changes primarily dealing with the management of training resources, integration of C-IED training and institutionalization of the threat are required. In addition, the creation of a C-IED Coordinator Course will provide the holistic knowledge required to conduct future

combined arms C-IED campaigns. Through the coordination, integration, and synchronization of all warfighting functions to reduce the threat and effectiveness of IED's, future C-IED cells can, as MCDP-1 *Warfighting* describes, "pose the enemy not just with a problem, but with a dilemma – a no win situation."[58]

Appendix A

RCT-1 C-IED Cell Roles and Responsibilities

As discussed above, RCT-1 had limited exposure to training in the functioning of the C-IED cell. As the organization and structure of the cell grew and matured, the roles of the individuals involved, solidified and became more efficient. While many individuals provided important contributions to the C-IED Cell, the below builds upon Figure 2 and summarizes the duties and responsibilities of the core members of the C-IED cell that created the foundation for all major decisions and actions.

C-IED Coordinator:

As the lead member of the cell, the coordinator is responsible to the Commanding Officer for all aspects of the C-IED fight. As the title suggests, the coordinator integrates and synchronizes the actions of all supporting agencies, and enablers. This action occurs in much the same way as a Fire Support Coordinator (FSC) takes the different supporting arms and produces an overall fire support plan. The C-IED coordinator uses all available assets and enablers at his disposal to produce a combined arms effect. In similar fashion as an FSC, the C-IED Coordinator does not own the assets in which he is synchronizing. Relying on the continuous communication with the cell members and related staff functions, the coordinator as the commander's advocate, ensures unity of effort to achieve a reduction in the IED threat through systematic analysis, integration, targeting, and problem solving. The coordinator chairs all C-IED working groups and meetings, as well as develops a concept of support for each operation to identify and reduce the IED threat based on the ground concept of maneuver. Additionally, the coordinator frequently releases C-IED specific fragmentary orders to direct unit action and specify policy guidelines.

C-IED Advisor:

Because the Coordinator cannot be everywhere at the same time, the C-IED Advisor provides an additional and critical feedback mechanism that the Coordinator uses to adjust priorities of effort across the C-IED LOO's (Attack the Network, Defeat the Device, and Train the Force). The Advisor acts at the "eyes and ears" of the C-IED cell across the battlefield, by frequent interaction with subordinate units to better comprehend the threat, and the tactics, techniques, and procedures (TTP's) that are currently employed. The Advisor identifies deficiencies in equipment, training, and personnel, and brings it to the attention to the Coordinator and the C-IED Cell for action and resolution. In the case of RCT-1, the C-IED Advisor was the Regimental Gunner who by his primary billet, conducted numerous battlefield circulation visits, and was a logical choice for role within the C-IED Cell due to his vast experience and knowledge.

C-IED Assistant:

The C-IED assistant was not originally included within the cell organization, but instead developed out of necessity as the overall scope and responsibilities increased throughout the RCT-1 deployment. The assistant augmented the Coordinator in the daily execution of C-IED operations. Responsibilities ranged from preparation of working groups and meetings, to coordinating with subordinate units and Field Service Representatives (FSR's) for future training and C-IED initiatives. For RCT-1 the role of C-IED assistant was given as a collateral duty to a mature and competent Non-Commissioned Officer (NCO).

EOD Platoon Commander:

In the case of RCT-1, the unit was collocated with their Direct Support (DS) Explosive Ordinance Disposal (EOD) Platoon Headquarters. In addition to the Platoon Commander's responsibilities to his higher headquarters and subordinate EOD Teams, he took an active role

within the RCT-1 C-IED Cell as the technical subject matter expert. The Platoon Commander provided the "ground truth" on the type of devices the enemy was emplacing, and offered valuable recommendations on countering the threat. Most importantly, the relationship with EOD offered the cell with another conduit through which to communicate. The dual channels offered through the formal EOD and RCT chains of command facilitated the rapid dissemination of valuable information to include changes in friendly/enemy TTP's. In addition to being a key contributor to every C-IED working group and meeting, EOD maintained an active role along the Train the Force (TtF) LOO. Most significant of their contributions was the construction and operation of a mock IED lane simulating the environment and every type of IED encountered within the RCT-1 area of operations. As enemy TTP evolved, so too did the IED lane adjust in order to reflect the reality encountered on the battlefield. The full extent of the EOD involvement within the C-IED cell cannot be underestimated.

IDD Supervisor:

Like the C-IED Assistant, the IED Detection Dog (IDD) Supervisor was a position that evolved with the organizational structure of the RCT-1 C-IED Cell. As the cell matured and gained experience, the realization of the capabilities IDD's presented, necessitated greater supervision in order to maximize the results. Out of this necessity, RCT-1 assigned an IDD Supervisor, who was responsible for the tactical integration of IDD's as a weapon to combat the threat. The supervisor tracked the individual IDD/Handler teams, their specific issues, medical requirements, and sustainment training. Coordination with available veterinarian care and FSR support by the supervisor ensured the teams were operating at peak performance. The RCT began conducting periodic sustainment training just as a rifleman would qualify on a range. The additional training facilitated the passage of new TTP's and provided the C-IED Cell with latest information on their employment capabilities and limitations. In addition, the IDD Supervisor

maintained an open relationship with other Military Working Dogs (MWD) units in order to request specialized capabilities to augment forces during large scale operations.

C-IED Intelligence Analyst:

Although everyone in the C-IED Cell conducted analysis of available intelligence and reporting to varying degrees, the C-IED Intelligence analyst provided one of the key linkages directly to the RCT-1 Intelligence section. Working for the Intelligence Officer, but also a key member of the C-IED Cell, the analyst was able to fuse information to provide a common picture of the IED threat environment to include network analysis. A common understanding of the IED threat between the C-IED cell and intelligence section was crucial in order to ensure unity of effort. Responsibilities for the analyst included attending and participating in all C-IED working groups and meeting by providing updates on enemy trends and TTP's. Based on the discussions within the meetings, the analyst was able to take action on C-IED intelligence requests and make adjustment to intelligence surveillance, and reconnaissance (ISR) collection assets.

Anti-Terrorism/Force Protection Officer:

The AT/FP Officer was one of the few collateral duties already assigned by the RCT prior to deployment. With responsibilities to ensure the correct force protection posture for the unit in a garrison environment, those same requirements only expanded during combat operations. The AT/FP Officer's primary responsibility was to identify potential threats against personnel and infrastructure and emplace active and passive measures to deter and/or disrupt those events from occurring. Because the RCT viewed AT/FP through a holistic lens, it made organizational and functional sense to group the role of Special Equipment Issue (SEI) Manager and Electronic Warfare Officer (EWO) as subordinate elements to the overall AT/FP plan. This grouping ensured unity of effort along the warfighting function of force protection, and also facilitated the RCT-1 manning and training prior to deployment. In the case of RCT-1, the

AT/FP officer was the Chemical Biological Radiological and Nuclear Defense (CBRND) Officer who was also trained in Counter Radio Controlled IED Electronic Warfare (CREW).

Special Equipment Issue (SEI) Manager:

The SEI Manager was another collateral duty which grew in scope as the RCT-1 deployment progressed. With the procurement and fielding of additional specialized equipment that did not fall under traditional Marine Corps supply and maintenance activities, it was necessary to create the role of SEI Manager. Items such as Ground Based Observation and Surveillance Systems (G-BOSS), Persistent Ground Surveillance Systems (PGSS), and man packable CREW systems as well as a host of other items, required a dedicated effort to maintain existing systems, and advocate for the requisition of additional ones. Part force protection, part maintenance management, and part FSR liaison, the SEI manager played a crucial role in providing unique capabilities to the combined arms fight. The SEI manager was responsible for coordinating with subordinate units to track current maintenance issues and forwarding requests for support (training or maintenance) to the appropriate contractor. In addition, he provided recommendations to the RCT and higher headquarters for the placement of extremely high value equipment with its justifications and concept of employment. In the case of RCT-1, the SEI manager was also the AT/FP officer who was provided assistance in his daily duties by the C-IED assistant.

Electronic Warfare Officer (EWO):

As mentioned previously the RCT-1 EWO was also the CBRN Officer who received the specialized CREW training prior to deployment. Within the C-IED Cell the EWO's responsibilities included tracking and analyzing the RCIED threat, training and educating subordinate units, managing equipment issues, and coordinating with higher headquarters. In coordination with EOD, as new RCIED threats emerged, the EWO would disseminate

appropriate counter measures to mitigate or defeat the enemy TTP. The feedback mechanisms provided by the C-IED advisor, EOD reports, and after actions, would enable the EWO to make recommendations to the C-IED cell for adjustments in unit policies or TTP's.

Targeting Officer:

Focused specifically along the Attack the Network (AtK) LOO and in coordination with the Intelligence section, the Targeting Officer provided the C-IED Cell with the updated network analysis of IED makers, emplacers, and facilitators. While the Targeting Officer was a key contributor to the cell, C-IED was only one of many aspects that fed into the separate and specific Targeting Working Groups with subordinate units and higher headquarters. Due to the involvement within AtK, Alternate Compensatory Control Measures (ACCM) also fell under his supervision, working in close coordination with the C-IED Operations Integration Cell (COIC). Originally staffed by another officer, the duties of the ACCM Manager were fulfilled by the Targeting Officer himself by the end of the deployment.

Counter IED Operations Integration Cell (COIC):

As a C-IED enabler provided to the RCT, COIC provided a wealth of knowledge and subject matter expertise to the C-IED Cell. (Focused along the Attack the Network (AtN) LOO COIC's mission is "To support all combatant commanders with fused analytical products to enable more precise attacks to defeat networks employing IEDs.[59] With a tremendous amount of "reach back" capability to other sources of information and analysis, the COIC team was able to provide an in depth understanding of the insurgent C-IED network with specific attention to the information requirements of the requesting unit. Staffed with an Operations team leader with up to four dedicated C-IED analysts, the cell was capable of simultaneously conducting multiple long term requests for information (RFI's) while maintaining the ability to rapidly answer "quick turn" RFI's as the mission required. Realizing the potential of ACCM operations the C-IED

coordinator and COIC team leader decided to dedicate one COIC analyst to the ACCM effort. Working directly with the ACCM Manager, the RCT and subordinate battalions were able to increase ACCM operations and have multiple successes within the Attack the Network C-IED LOO.

Operational Research and Systems Analyst (ORSA):

The ORSA representative provided augmentation to the RCT intelligence section's ability to provide in dept statistical analysis on IED trends. The ORSA provided "analytic products (e.g. decision aids, models) to underpin decisions by Commanders and to enable solutions."[60] The data derived from his research assisted in the C-IED Cell's ability to better understand the threat environment and helped drive decisions to adjust priorities of effort or implement new C-IED procedures. ORSA's ability to accurately display measures of effectiveness (MOE's) enabled the cell to track their progress.

Weapons Technical Intelligence (WTI):

As the Marine Corps C-IED doctrine states, "WTI provides critical forensics to identify adversary centers of gravity and design effective force protection measures."[61] For RCT-1, this aspect of the C-IED fight was carried out by Weapons Intelligence Team (WIT) from the Combined Explosives Exploitation Cell (CEXC). As a member of the C-IED Cell, the WIT provided technical updates on the exploitation of IED's and their components found within the area of operations, as well as maintaining awareness on evolving enemy trends and TTP's across the theater. Following the discovery or detonation of an IED, the WIT was able to track the information gained from the specific IED and provide vital intelligence to better assist in understanding the IED network. In addition, the WIT provided a training capability to subordinate units to increase their knowledge and expertise in the exploitation process.

Biometric Manager:

Approximately four months into the deployment the Biometric Manager was formally added to the organization of the C-IED Cell. Up until that time the cell had largely ignored that aspect due to inexperience and obscure HHQ policies regarding enrollment activities. Unlike the battalions who had a dedicated Biometric Support Advisor (BSA) FSR, the RCT also required an individual to monitor and supervise the overall biometric program. Working closely with the Law Enforcement Personnel (LEP) and the WIT, the Biometric Manager coordinated support to the subordinate units by prioritizing and procuring assets by unit, facilitating additional training, and resolving issues with the dissemination of information pertaining to biometric databases.

Appendix B

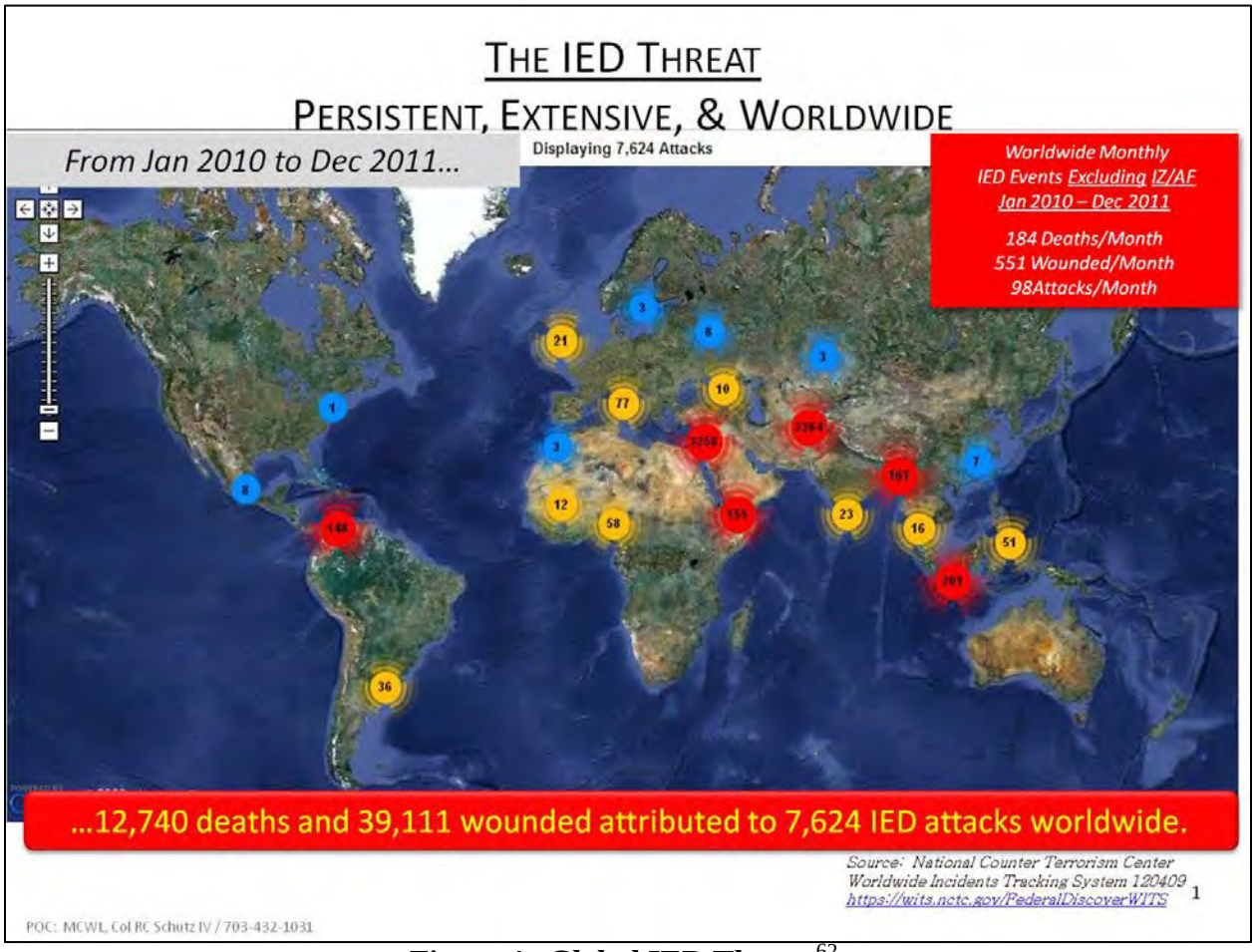

Figure 4. Global IED Threat [62]

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